CLAIMS

1. A method of operating a fuel reformer, comprising the steps of:

determining the temperature of a reformate gas produced by the fuel reformer, and

adjusting an air-to-fuel ratio of an air/fuel mixture processed by the fuel reformer based on the temperature of the reformate gas.

2. The method of claim 1, wherein:

the fuel reformer has an air inlet valve associated therewith, and

the adjusting step comprises adjusting position of the air inlet valve based on the temperature of the reformate gas.

3. The method of claim 1, wherein:

the determining step comprises comparing the temperature of the reformate gas to a predetermined temperature value, and

the adjusting step comprises reducing the air-to-fuel ratio of the air/fuel mixture if the temperature of the reformate gas is greater than the predetermined temperature value.

4. The method of claim 3, wherein:

the fuel reformer has an air inlet valve associated therewith, and

reducing the air-to-fuel ratio of the air/fuel mixture comprises adjusting position of the air inlet valve so as to reduce a flow of air advancing therethrough.

5. The method of claim 1, wherein:

the determining step comprises comparing the temperature of the reformate gas to a predetermined temperature value, and

the adjusting step comprises increasing the air-to-fuel ratio of the air/fuel mixture if the temperature of the reformate gas is less than the predetermined temperature value.

6. The method of claim 5, wherein:

the fuel reformer has an air inlet valve associated therewith, and

increasing the air-to-fuel ratio of the air/fuel mixture comprises adjusting position of the air inlet valve so as to increase a flow of air advancing therethrough.

7. The method of claim 1, wherein the determining step comprises sensing the temperature of the reformate gas with a temperature sensor.

8. A fuel reforming assembly, comprising:

a fuel reformer,

a temperature sensor, and

a controller electrically coupled to both the fuel reformer and the temperature sensor, wherein the controller comprises (i) a processor, and (ii) a memory device electrically coupled to the processor, the memory device having stored therein a plurality of instructions which, when executed by the processor, causes the processor to:

(a) monitor output from the temperature sensor so as to determine the temperature of a reformate gas produced by the fuel reformer, and

(b) adjust an air-to-fuel ratio of an air/fuel mixture processed by the fuel reformer based on the temperature of the reformate gas.

9. The fuel reforming assembly of claim 8, further comprising an electrically-controlled air inlet valve, wherein:

the air inlet valve is electrically coupled to the processor, and

the plurality of instructions, when executed by the processor, further cause the processor to adjust position of the air inlet valve based on the temperature of the reformate gas.

10. The fuel reforming assembly of claim 8, wherein the plurality of instructions, when executed by the processor, further cause the processor to:

(a) compare the temperature of the reformate gas to a predetermined temperature value, and

(b) reduce the air-to-fuel ratio of the air/fuel mixture if the temperature of the reformate gas is greater than the predetermined temperature value.

11. The fuel reforming assembly of claim 8, further comprising an electrically-controlled air inlet valve, wherein:

the air inlet valve is electrically coupled to the processor, and

the plurality of instructions, when executed by the processor, further cause the processor to:

(a) compare the temperature of the reformate gas to a predetermined temperature value, and

(b) adjust position of the air inlet valve so as to reduce a flow of air advancing therethrough if the temperature of the reformate gas is greater than the predetermined temperature value.

12. The fuel reforming assembly of claim 8, wherein the plurality of instructions, when executed by the processor, further cause the processor to:

(a) compare the temperature of the reformate gas to a predetermined temperature value, and

(b) increase the air-to-fuel ratio of the air/fuel mixture if the temperature of the reformate gas is less than the predetermined temperature value.

13. The fuel reforming assembly of claim 8, further comprising an electrically-controlled air inlet valve, wherein:

the air inlet valve is electrically coupled to the processor, and

the plurality of instructions, when executed by the processor, further cause the processor to:

(a) compare the temperature of the reformate gas to a predetermined temperature value, and

(b) adjust position of the air inlet valve so as to increase a flow of air advancing therethrough if the temperature of the reformate gas is less than the predetermined temperature value.

14. The fuel reforming assembly of claim 8, wherein:

the fuel reformer comprises a reactor housing, and

the temperature sensor is positioned in the reactor housing.

15. The fuel reforming assembly of claim 8, wherein:

the fuel reformer comprises a reactor housing, and

the temperature sensor is positioned outside the reactor housing.

16. A method of operating a fuel reformer, the method comprising the steps of:

operating the fuel reformer so as to process an air/fuel mixture having a first air-to-fuel ratio during a first period of time,

determining the temperature of a reformate gas produced by the fuel reformer during the first period of time, and

operating the fuel reformer so as to process an air/fuel mixture having a second air-to-fuel ratio during a second period of time based on the temperature of the reformate gas, the air/fuel mixture having the second air-to-fuel ratio being different than the air/fuel mixture having the first air-to-fuel ratio.

17. The method of claim 16, wherein:

the fuel reformer has an air inlet valve associated therewith,

the step of operating the fuel reformer so as to process the first air/fuel mixture having a first air-to-fuel ratio comprises positioning the air inlet valve at a first valve position, and

the step of operating the fuel reformer so as to process the second air/fuel mixture having the second air-to-fuel ratio comprises positioning the air inlet valve at a second valve position, the second valve position being different that the first valve position.

18. The method of claim 16, wherein the determining step comprises sensing the temperature of the reformate gas with a temperature sensor.